REMARKS

Claims 1-42 are pending in the application. Claims 1-4, 6-13, 15-22, 24-27, 32-37 and 39-42 were rejected, and the remaining claims were objected to. Claims 3, 4, 11, 12, 13, 22, and 42 are amended herein. All claims remain active in the application. In view of the amendments to the claims and the following remarks, reconsideration of the application is respectfully requested. No new matter has been added by this amendment.

Claim Rejections – 35 U.S.C. § 103

Claims 1-4, 6-13, 15-22, 24-27, 32-37 and 39-42 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cloonan, U.S. Patent Publication 2002/0009051 ("Cloonan") in view of Silberschatze et al., U.S. Patent No. 6,556,578 ("Silberschatz"). Applicant respectfully traverses this rejection, and submits that the combination of Cloonan and Silberschatz fail to create a *prima facie* case of obviousness for the claims as amended. This response generally considers the rejected claims in the same order that the claims were addressed in the Office Action.

Claims 11 and 42

Regarding claims 11 and 42, Applicant has amended those claims in a manner that is believed to overcome the present rejection. Both Cloonan and Silberschatz teach controlling global buffer occupancy, i.e., discarding packets when the global buffer usage reaches a certain level. Cloonan's approach is to determine each packet's priority (from its header) and the global data flow rate, and look up a matrix block for the parameter pair. Each matrix block defines a typical RED threshold pair and discard probability, which are compared to the amount of global buffer memory used to determine whether a packet will be dropped. Silberschatz teaches making a global decision based on global average queue occupancy and a single RED threshold pair and discard probability as to whether a packet should be dropped. If a packet should be dropped, a packet that is already in the buffer memory is discarded, preferably from a round-robin selection of "offending" queues.

Neither Cloonan nor Silberschatz teach associating each data packet queue with a drop probability profile selected from a pool of profiles as claimed. Even if Cloonan incorporated multiple queues, his "matrix" selection is associated with global parameters and packet priority, which would not vary with queue and are therefore not "associated" with a

queue. Likewise, Silberschatz fails to teach associating a drop probability profile with individual queues, but used global parameters to determine whether to drop a packet.

Applicant also has amended claims 11 and 42 to further emphasize that a drop/no-drop decision is based on the associated profile and the destination data packet queue size. Thus unlike Cloonan and Silberschatz, these claims control each queue based on its own associated profile and queue size, not on global buffer values. Applicant respectfully submits that Cloonan and Silberschatz fail to teach each element of claims 11 and 42, nor do the references provide a suggestion to perform the method as currently recited.

Claim 33

Claim 33 requires a random early detection traffic conditioning circuit that contains elements not taught by Cloonan and Silberschatz. The rejection states that Cloonan snoops packet priority and data rate—neither of these constitutes the claimed circuit element that snoops queue information from the packet. As described in the specification at page 10, embodiments of the present invention accomplish this, e.g., by performing a preliminary classification on the packet and prepending an internal-use header containing queue information. Cloonan discloses no similar capability for snooping queue information. Silberschatz merely queues all packets, and then determines later whether a packet already in the queue should be dropped.

Claim 33 also requires that the circuit select and use a "segment-based drop probability profile." No such profile is disclosed by Cloonan or Silberschatz. Both references use a standard RED global function identical to that illustrated as prior art in Figure 1 of the present application (compare, e.g., Cloonan Figure 4 with Figure 1 of the present application). The application specifically states that Figure 1 is not a "segment-based drop probability profile" as claimed:

> A "segment-based" drop probability profile requires more than one segment. For instance, Figure 1 does not illustrate such a drop probability profile as it has only one linear segment (the never-drop region below min_{th} and the always-drop region above max_{th} are not segments, since no probabilistic outcome is associated with them). (page 8, line 23 to page 9, line 2.)

Thus the claim language "segment-based drop probability profile" cannot be reasonably construed to cover the prior art RED functions used by Cloonan or Silberschatz—the application explicitly disclaims such an interpretation. Applicant respectfully submits that the references fail to disclose all elements of claim 33, and thus fail to establish a *prima facie* case of obviousness.

Claims 1, 13, 21, and 40

Each of these claims is patentable at least for reasons presented above. Claims 1, 21, and 40 each explicitly require a "segment-based drop probability profile," as addressed above and not disclosed by the references. Claim 13 has been amended to specify similarly that the segments are "drop probability profile" segments. Each claim also requires use of a queue size, not a global buffer size as used by the references. Each claim further requires an association between a queue and a profile for that queue.

Claims 2, 20, 41

Each of these claims is patentable at least for reasons presented above. Further, Cloonan fails to disclose a "drop priority" as recited in these claims. As disclosed in the specification, this is more than a mere traffic class, but depends on whether traffic from that class meets a rate profile (see, e.g., pages 10-11 of the specification).

Claims 3, 4, 12, 19, 22, 24, 26, 6, 15, 25, and 10

Each of these claims is patentable at least for reasons presented above. Furthermore, claims 3, 4, 12, and 22 have been amended to further specify the disclosed relationship between the high threshold and delta threshold—a relationship not found in the references.

With regard to claims 10, 19, and 26, these claims encompass different segment types, as exemplified, e.g., at page 15, lines 13-16. The references fail to disclose such a concept, as they only disclose the simple RED ramp configuration.

Claims 7, 16, 8, 17, 18, and 9

Each of these claims is patentable at least for reasons presented above. The rejection further asserts that Cloonan discloses the additional claim limitation found in these claims. Cloonan's disclosure emulates a ramp between its MIN and MAX points (see Figure 4). In contrast, these claims use a constant probability P_i for each segment S_i.

Claim 27

This claim is patentable at least for reasons presented above. The Examiner asserts that it would be obvious to one of ordinary skill to use a pointer register in Cloonan's system. This argument appears to be beside the point, because Cloonan not only fails to disclose a

pointer register, but does not disclose the equivalent of indexing such a register with a data packet queue identifier.

Claim 32

Claim 32 is patentable for at least the same reasons as claim 21.

Claim 34

This claim is patentable at least for reasons presented above. Although Silberschatz does disclose calculating a "queue occupancy," (presumably in his CPU, see Fig. 1B), this value is not maintained by a packet pipeline that produces a packet drop/no drop decision before the packet is queued.

Claim 35

This claim is patentable at least for reasons presented above. Applicant respectfully disagrees with the assertion that Cloonan discloses the claimed queue information corresponding to a destination port and traffic class. Cloonan does not associate queues with "needy to super greedy" data flows, as those flow rate classes are global and queue-independent. Further, the data flow rate is not a destination port as claimed.

Claims 36 and 37

These claims are patentable at least for reasons presented above. Like other claims above, these claims speak of a "drop priority." As disclosed in the specification, this is more than a mere traffic class, but depends on whether traffic from that class meets a rate profile.

Claim 39

This claim is patentable at least for reasons presented above. Cloonan fails to teach or suggest that multiple ingress interfaces could share the same packet pipeline, or any infrastructure that would support such an arrangement. Silberschatz has multiple interfaces and resorts to dropping packets after they are resident in the queue memory. Clearly nothing in the two references suggests coupling multiple ingress interfaces to a common pipeline prior to a queue memory.

In conclusion, Applicant respectfully submits that the combination of references fails to teach or suggest all elements of any rejected claim, and therefore fails to create a *prima facie* case of obviousness.

Allowable Subject Matter

Applicant acknowledges the indication of allowable subject matter in claims 5, 14, 23, 28-31, and 38. Applicant has elected not to rewrite the claims in independent form at this time, based on the arguments above that the claims from which the indicated allowable claims depend are patentable as well.

Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1-42 of the application as amended is respectfully solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via facsimile number 1-803-872-9306, on July 3, 2004.

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